Beacon Video Reconstitutor (BVR)

Purpose: The purpose of the BVR is to provide displayable (or reconstituted) video of Mode S beacon targets at ARTS-II sites with ASR-7 or –8 primary radars that do not have the RSCIP (Remote Surveillance and Communications Interface Processor) hardware needed for this capability, providing the full Mode S display functionality and optimization.

Current Mode S Secondary Surveillance Radars (SSRs) at some terminal sites (e.g. ARTS-II) employing ASR-7 and -8 primary radars are interfaced to terminal automation systems without the benefit of the full functionality and display optimization of the RSCIP present in other terminal automation configurations (e.g. ASR-9). This interface provides fully reconstituted SSR target data synchronized with the primary radar. Thus, without the BVR, and with the cost-prohibitions of RSCIP implementation, these ASR-7 and -8 sites are precluded from the full Mode S display functionality and optimization available, resulting in ATC surveillance operations being conducted (still) in a 1970's era display mode.

Background

One of the outcomes of Mode S, OT&E, terminal testing in 1993 and 94 was the need to provide the kind of displayable beacon video (reconstituted) generated by ASR-9/RSCIP hardware at -9 terminal sites for sites employing ASR-7 and -8 primary radars without the RSCIP (which is cost-prohibitive).

The number of ASR-7 and -8 terminal sites, where there is no 'reconstituted' beacon video available, is 25. The only beacon video available for these terminal systems is from the Mode S front-end (i.e. the Interim Beacon Interrogator signal, or IBI Mode). It provides only sliding window detection target data without selective interrogation, target tracking, false target elimination processing, and other, etc. Mode S display features. Mode S systems at 22 of the 25 terminal sites are currently operating in IBI Mode only, and waiting for BVR deployment, in order to go into full Mode S surveillance operation. Production efforts by FAA Product Team engineers are completed, and production BVRs are being delivered to the depot for future installation at field sites. Three key sites are now operational. Capabilities included are as follows:

- Provides ARTS IIA automation systems with full digital surveillance data for aircraft tracking.
- Accepts Terminal CD-2 formatted Mode S surveillance messages, and ASR-7 and –8 (normal and MTI) video signals, ACPs, ARPs, and radar pre-triggers.
- Generates reconstituted ATCRBS video, triggers, and Mode triggers derived from Mode S surveillance messages.
- Generates 3/A (ID) and C (altitude) reply types.
- Generates up to four overlapped beacon replies.
- Generates delayed: radar video (normal and MTI), ACP, ARP, and radar pre-trigger.
- Operates over ASR-7 and –8 PRF of 800- 1200, and scan rates of 4- 4.8 seconds.
- Provides manual bypass switch to allow raw video inputs to the ARTS.

Key Projects

- Product Team engineers performed the design, development, and testing of the first pre-production, BVR prototypes, and have awarded the production contract to ION Corporation to manufacture the required production units.

Key Accomplishments

- Award: Production contract awarded to ION Corporation in August 7 '97 to produce 29 production units.
- Delivery of: 1st Art. to WJHTC, 5/98.
  2'd Art. Billgs. Mon, 8/98
  3'd Art. FAA, Ok. Cy, 8/98

Status

- Currently, the BVR is in mid-stage of the production program, and delivery of 13 production units by April '99 to the FAA, Oklahoma City depot is in process, awaiting deployment by field support.

Plans

- Deployment of FAA, Oklahoma City depot, BVR production units at the required 25 sites is planned, enabling full Mode S functionality.
- Delivery of balance of ION Corporation, BVR production units by June '99 to the FAA, Oklahoma City depot is planned, for eventual deployment to field sites.

To find out more about the Beacon Video Reconstituter (BVR) contact:

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